

## **REMARKS**

Applicant respectfully requests reconsideration and allowance of all pending claims in view of the above-amendments and the following remarks.

### I. **DRAWINGS**

Figure 3 was objected to as lacking the reference numeral “32”, which appears in the specification. Accordingly, Figure 3 is amended to contain reference numeral “32”.

### II. **CLAIM AMENDMENTS**

In the amended set of claims:

- the expression “and/or” has been replaced by “at least one of... or...”, in **claims 1, 3, 9, 17 and 18**;
- the terms “MMSE”, “EGC” and “ZF” have been defined in **claim 5**;
- **claims 1 and 17** have been amended to add the features of original claim 2. The step of “conversion” has been re-named to the step of “diagonalization” (see page 5, line 20 of the English specification);
- original **claim 2** has been cancelled;
- the wording “encoded symbols” has been replaced by “distributed symbols” in **claim 4**;
- the values of parameters  $A$ ,  $J$  and  $\gamma$  have been corrected in **claim 15**. Indeed, the total matrix in claim 15 as filed corresponds to the scheme with 8 transmit antennas and a rate of  $\frac{1}{2}$ , whereas the parameters  $A$ ,  $J$  and  $\gamma$  in claim 15 as filed corresponds to the scheme with 8 transmit antennas and a rate of  $\frac{3}{4}$ . See the English specification, pages 24-25 (corresponding to the scheme with 8 transmit antennas and a rate of  $\frac{1}{2}$ ).

New claim 1 is a combination of original claims 1 and 2. Claim 1 has been amended to define the first estimation steps and the interference cancellation iteration(s). Claim 1 has also been amended so that the common steps between original claims 1 and 2 appear only once.

New independent claim 1 and independent claim 18 are directed to two different example embodiments for the first estimation step. The common steps between the two embodiments are:

- the diagonalization step (disclosed in the specification on page 5, line 21, corresponding to a multiplication of the equalized signal by a diagonalization matrix); and
- the diversity pre-encoding step.

The different steps between the two embodiments correspond to a processing step, which can be implemented between the diagonalization step and the diversity pre-encoding step. This processing step can be, for example:

- either the pre-decoding and estimation steps of original claim 2, or
- the demodulation, deinterleaving, decoding, re-interleaving, re-modulation steps of original claim 18.

### III. CLAIM REJECTIONS – 35 USC §112

Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite with respect to the “and/or” appearing in claims 1, 3, 9, 17 and 18 and acronyms appearing in claim 5.

With this Amendment, claims 1, 3, 9, 17 and 18 are amended to replace “and/or” with “at least one of ... or ... .” Claim 5 is amended to define the acronyms “MMSE”, EGC” and “ZF”.

All claims are now believed to be sufficiently definite.

### IV. CLAIM REJECTIONS – 35 USC §103

Claims 1, 4, 8-13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak, European Patent No. 1133071 A2.

Claim 9 is rejected under 35 U.S.C. §103(a) as being unpatentable over Dabak in view of Doyle.

The Examiner does not raise any rejections regarding claim 2, whose features have been inserted in independent claims 1 and 17 in the amended set of claims.

As shown below, the independent claims are therefore consider patentable.

#### A. **Dabak**

Dabak relates to a Space Time Transmit Diversity encoding technique, which can be implemented in a wide band communication system of the WCDMA type.

Dabak does not disclose or suggest a first estimation of the symbols and an iterative interference cancellation technique according to an example embodiment of the present disclosure.

More specifically, independent claims have been amended to include the steps of diagonalization and diversity pre-encoding implemented during the first estimation, which are not disclosed in Dabak. Indeed, the diagonalization by multiplying the equalized signal by a diagonalization matrix, leading to a diagonal total encoding/channel/decoding matrix taking account of at least said encoding matrix and of a decoding matrix is not disclosed, or suggested by Dabak.

Moreover, Dabak does not suggest performing a decoding (diversity pre-decoding) followed by a re-encoding (diversity pre-encoding) at each iteration.

As a consequence, independent claims as amended are new and non-obvious.

#### B. Doyle

Doyle relates to a baseband encoding/decoding method and apparatus for increasing the transmission rate over a communication medium, while maintaining the desired bandwidth, bit error rate, and hamming distance.

Doyle does not relate to a decoding technique implementing an iterative interference cancellation, and steps of diagonalization and diversity pre-encoding during the first estimation.

As a consequence, Doyle in view of Dabak is not relevant toward Applicant's claim 9.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: /David D. Brush/  
David D. Brush, Reg. No. 34,557  
900 Second Avenue South, Suite 1400  
Minneapolis, Minnesota 55402-3319  
Phone: (612) 334-3222 Fax: (612) 334-3312